

**49 CFR 236 – RULES, STANDARDS, AND INSTRUCTIONS GOVERNING THE INSTALLATION,  
INSPECTION, MAINTENANCE, AND REPAIR OF SIGNAL AND TRAIN CONTROL SYSTEMS, DEVICES,  
AND APPLIANCES**

**On-the-Job Training Standards for Signal Maintenance Personnel**

*February 12, 2019*

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	<b>All Systems Subpart A</b>	<b>Automatic Block Subpart B</b>	<b>Interlocking Subpart C</b>	<b>Traffic Control Subpart D</b>	<b>ACS, ATS, ATC Subpart E</b>
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\*Power Operated Switch Machine

NOTE: Standards for dragging equipment detectors, slide detectors, and other similar devices are found in Subpart F.

NOTE: Definitions pertaining to 49 CFR 236 are found in Subpart G.

NOTE: Standards for processor-based signal and train control systems are found in Subpart H.

NOTE: Standards for positive train control systems are found in Subpart I.

49 CFR 236 is organized to include standards, (System design and installation standards), and rules and instructions for the inspection, testing, maintenance, and repair of signal and train control systems, devices, and appliances. Generally, on-the-job training standards only apply to the latter category, with a few exceptions. In those rare case where a design and installation standard exist without a corresponding inspection or test an OJT standard has been written.

<b>49 CFR 236 – OJT Worksheet</b>	<b>Other</b>	<b>OJT</b>
236.0 – Applicability, minimum requirements, and penalties	X	
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236.6 – Hand-operated switch equipped with switch circuit controller	X	
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236.14 – Spring switch signal protection; requirements	X	
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236.21 – Location of roadway signals	X	
236.22 – Semaphore signal arm; clearance to other objects	X	
236.23 – Aspects and indications	X	
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236.26 – Buffing device, maintenance	X	
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236.51 – Track circuit requirements	X	
236.52 – Relayed cut section	X	
236.53 – Track circuit feed at grade crossing	X	

<b>49 CFR 236 – OJT Worksheet</b>	<b>Other</b>	<b>OJT</b>
236.54 – Minimum length of track circuit	X	
236.55 – Dead section, maximum length	X	
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236.59 – Insulated rail joints	X	
236.60 – Switch shunting circuit, use restricted	X	
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236.71 – Signal wires on pole lines and aerial cable	X	
236.73 – Open-wire transmission line; clearance to other wire	X	
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236.76 – Tagging of wires and interference of wires or tags with signal apparatus	X	
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236.101 – Purpose of inspection and tests; removal from service of relay or device failing to meet requirements		X
236.102 – Semaphore or searchlight signal mechanism		X
236.103 – Switch circuit controller or point detector		X
236.104 – Shunt fouling circuit		X
236.105 – Electric lock		X
236.106 - Relays		X
236.107 – Ground tests		X
236.108 – Insulation resistance tests, wires in trunking and cables		X
236.109 – Time release, timing relays and timing devices		X
236.110 – Results of test	X	
<b>Subpart B – Automatic Block Signal Systems</b>		
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236.201 – Track-circuit control of signals	X	
236.202 – Signal governing movements over main track switch	X	
236.203 – Hand operated crossover between main tracks; protection	X	
236.204 – Track signaled for movements in both direction; requirements	X	
236.205 – Signal control circuits; requirements	X	
236.206 – Battery or power supply with respect to relay; location	X	
236.207 – Electric lock on hand-operated switch; control	X	
<b>Subpart C – Interlocking</b>	X	
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236.301 – Where signals shall be provided	X	
236.302 – Track circuits and route locking	X	
236.303 – Control circuits for signals; selection through circuit controller operated by switch points or by switch . . .	X	

<b>49 CFR 236 – OJT Worksheet</b>	<b>Other</b>	<b>OJT</b>
236.304 – Mechanical locking or same protection effected by circuits	X	
235.305 – Approach or time locking	X	
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236.310 – Signals governing approach to home signal.	X	
236.311 – Signal control circuits, selection through track relays or device functioning as track relays and through . . .	X	
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Rules and Instructions		
236.326 – Mechanical locking removed or disarranged, requirement for permitting train movement through . . .	X	
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236.335 – Dog, stops and trunnions of mechanical locking	X	
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236.337 – Locking faces of mechanical locking; fit	X	
236.338 – Mechanical locking required in accordance with locking sheet and dog chart	X	
236.339 – Mechanical locking, maintenance requirements	X	
236.340 – Electromechanical interlocking machine; locking between electrical and mechanical levers	X	
236.341 – Latch shoes, rocker links, and quadrants	X	
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236.376 – Mechanical locking		X
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236.386 – Restoring feature on power switches		X
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<b>49 CFR 236 – OJT Worksheet</b>	<b>Other</b>	<b>OJT</b>
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236.401 – Automatic block signal system and interlocking standards applicable to traffic control systems	X	
236.402 – Signals at control points	X	
236.403 – Signals at control point	X	
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236.407 – Approach or time locking, where required	X	
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236.410 – Locking. Hand-operated switch; requirements	X	
Rules and Instructions		
236.426 – Interlocking rules and instructions applicable to traffic control systems	X	
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236.476 – Interlocking inspections and tests applicable to traffic control systems	X	
<b>Subpart E – Automatic Train Stop, Train Control and Cab Signal Systems</b>	X	
Standards		
236.501 – Forestalling device and speed control	X	
236.502 – Automatic brake application, initiation by restrictive block conditions stopping distance in advance	X	
236.503 – Automatic brake application, initiation when predetermined rate of speed exceeded	X	
236.504 – Operation interconnected with automatic block signal system	X	
236.505 – Proper operative relationship between parts along roadway and parts on locomotive	X	
236.506 – Release of brakes after automatic application	X	
236.507 – Brake application; full service	X	
236.508 – Interference with application of brakes by means of brake valve	X	
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236.511 – Cab signals controlled in accordance with block conditions stopping distance in advance	X	
236.512 – Cab signal indication when locomotive enters block where restrictive conditions obtain	X	
236.513 – Audible inductor	X	
236.514 – Interconnection of cab signal system with roadway signal system	X	
236.515 – Visibility of cab signals	X	
236.516 – Power supply	X	
Rules and Instructions; Roadway		
236.526 – Roadway element not functioning properly	X	
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236.528 – Restrictive condition resulting from open hand-operated switch; requirements	X	
236.529 – Roadway element inductor; height and distance from rail	X	
236.531 – Trip arm; height and distance from rail	X	

<b>49 CFR 236 – OJT Worksheet</b>	<b>Other</b>	<b>OJT</b>
236.532 – Strap iron inductor; use restricted	X	
236.534 – Entrance to equipped territory; requirements	X	
Rules and Instructions; Locomotives		
236.551 – Power supply voltage; requirements	X	
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236.553 – Seal; where required	X	
236.554 – Rate of pressure reduction; equalizing reservoir or brake	X	
236.555 – Repaired or rewound receiver coil	X	
236.556 – Adjustment of relay	X	
236.557 – Receiver; location with respect to rail	X	
236.560 – Contact element, mechanical trip type, location with respect to rail	X	
236.562 – Minimum rail current required	X	
236.563 – Delay time	X	
236.564 – Acknowledging time	X	
236.565 – Provision made for preventing operation of pneumatic brake-applying apparatus by double-heading . . .	X	
236.566 – Locomotive of each train operating in train stop, train control or cab signal territory; equipped	X	
236.567 – Restrictions imposed when device fails and/or is cut out en route	X	
236.568 – Difference between speeds authorized by roadway signal and cab signal; action required	X	
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236.576 – Roadway element		X
236.577 – Test, acknowledgement, and cut-in circuit		X
Inspection and Tests; Locomotive		
236.586 – Daily or after trip test		X
236.587 – Departure test		X
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236.589 - Relays		X
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<b>Subpart F – Dragging equipment and slide detectors and other similar protective devices</b>		
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<b>Subpart G – Definitions (Not Applicable – Definitions only)</b>	X	
<b>Subpart H – Standards for processor-based signal and train control systems</b>	X	
236.901 – Purpose and scope	X	
236.903 – Definitions	X	
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<b>49 CFR 236 – OJT Worksheet</b>	<b>Other</b>	<b>OJT</b>
236.911 – Exclusions	X	
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236.915 – Implementation and operation	X	
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236.921 – Training and qualification program. General	X	
236.923 – Task analysis and basic requirements	X	
236.925 – Training specific to control office personnel	X	
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<b>Subpart I – Positive train control systems</b>	X	
236.1001 – Purpose and scope	X	
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236.1005 – Requirements for Positive Train Control systems	X	
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236.1009 – Procedural requirements	X	
236.1011 – PTC Implementation Plan content requirements	X	
236.1013 – PTC Development Plan and Notice of Product Intent content requirements and Type Approval	X	
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236.1017 – Independent third party Verification and Validation	X	
236.1019 – Main line track exception	X	
236.1021 – Discontinuances, material modifications, and amendments	X	
236.1023 – Errors and malfunctions	X	
236.1027 – PTC system exclusions	X	
236.1029 – PTC system use and failures	X	
236.1031 – Previously approved PTC systems	X	
236.1033 – Communications and security requirements	X	
236.1035 – Field testing requirements	X	
236.1037 – Records retention	X	
236.1039 – Operations and Maintenance Manual	X	
236.1041 – Training and qualification program, general	X	
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236.1045 – Training specific to office control personnel	X	
236.1047 – Training specific to locomotive engineers and other operating personnel	X	
236.1049 – Training specific to roadway workers	X	

## FOREWORD

These On-the-Job Training (OJT) Standards have been written with an assumption that the employee performing each task has the requisite understanding of basic electricity, ability to operate a volt-ohm-milliamp meter (and other electric/electronic test equipment) and the ability to correctly interpret its readings. The employee must also be able to read and interpret circuit plans and track and location plans, have an understanding of the basic operating principles and the fundamental concepts of operation of railroad signal systems.

OJT is an important facet of individual development and traditionally occurs in the workplace (e.g., the employee learns the job while doing the job). OJT provides the opportunity for an employee to apply the concepts learned in the classroom by developing skills through practice and repetition; and to demonstrate personal mastery of critical safety tasks. An employee may perform these tasks under the direct onsite observation of any qualified person, provided the qualified person is a member of the same occupational category. However, the qualified person must be advised that they are accepting responsibility for the action of the observed employee and must be capable of recognizing and intervening if an unsafe act or act of non-compliance with Federal railroad safety laws, regulations, or orders occurs. These tasks must only be performed after measures are taken to ensure for the safe operation of trains, on-track equipment, roadway workers, and the public.

**Warning: 49 CFR §236.4 Interference with the normal function of device is always in affect.**

**49 CFR §236.4 Interference with the normal function of device.**

**Safety of train operation must be provided before interfering with the normal function of any device.**

The following skills are critical to the safety of the public and railroad employees:

**Apply 49 CFR Part 236**

<b><u>Performance</u> Tasks</b>	<b><u>Conditions</u> Tools, Equipment, Documents, Practice</b>	<b><u>Standards</u> Time, Completeness, or Accuracy</b>
<b>Task 1-1 Purpose of inspections and tests; removal from service of relay failing to meet test requirements.</b> Demonstrate the ability to safely remove a relay from service and restore the system to normal operation. (236.101)	<p>Given a relay that has failed to function within the manufacturer's design parameters, specification and/or railroad's condemning limits the employee must be able to demonstrate the ability to:</p> <p><b>NOTE:</b> This task is seldom required to be performed, but when it must be performed it must be accomplished with 100 percent accuracy. Maintaining proficiency at this task may be problematic. Hence, retraining may be required before repeating this task.</p>	<p>Safely remove the relay from service and restore system operation by installing a new relay.</p> <p>The employee must complete this task and the results properly recorded no less than three (3) times with 100 percent accuracy.</p> <p>Referenced or associated rules: 49 CFR §§236.8 and 236.110.</p>

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<p><u>Performance</u> Tasks</p>	<p><u>Conditions</u> Tools, Equipment, Documents, Practice</p>	<p><u>Standards</u> Time, Completeness, or Accuracy</p>
<p><b>Task 1-2 Signal mechanism</b> Demonstrate the ability to inspect and test semaphore or searchlight signal mechanism. (236.102)</p>	<p>Inspect a Semaphore/Searchlight Mechanism: Given a semaphore signal or searchlight mechanism the employee will demonstrate the ability to:</p> <p><b>NOTE:</b> This inspection is required every six months.</p> <hr/> <p>Test a Semaphore/Searchlight Mechanism: Given a semaphore signal or searchlight mechanism, the appropriate test equipment, and the manufacturer's operating characteristics and condemning limits the employee will demonstrate the ability to:</p> <p><b>WARNING:</b> Tests should not be conducted while rail traffic is approaching or within the section to be tested.</p> <p><b>NOTE:</b> This test is required every two years. Maintaining proficiency at this task may be problematic. Hence, retraining may be required before repeating this task.</p>	<p>Inspect a semaphore signal for adequate clearance from foreign obstructions and freedom of armature movement; dirty, broken, chipped, or cracked roundels; dirt or foreign material within the mechanism; that any buffer mechanism does not allow a more permissive aspect to be displayed that intended; and ensure that the signal is aligned properly for the track that it governs.</p> <p>Inspect at least five (5) searchlight mechanisms for improperly installed or burnt ribbons and contacts; freedom of armature movement; dirty, broken, chipped, or cracked roundels or lenses; dirt or foreign material within the mechanism; ensure that the signal is aligned properly for the track that it governs and record the results with 100 percent accuracy.</p> <hr/> <p>Test a minimum of five (5) semaphore signal and/or searchlight mechanisms to ensure that the device is functioning within the manufacturer's recommended operating parameters and record the results with 100 percent accuracy.</p> <p>Referenced or associated rules: 49 CFR §§236.4, 236.8, 236.11, 236.21, 236.22, 236.26, and 236.110.</p>

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<b><u>Performance</u> Tasks</b>	<b><u>Conditions</u> Tools, Equipment, Documents, Practice</b>	<b><u>Standards</u> Time, Completeness, or Accuracy</b>
<b>Task 1-3 Switch circuit controller or point detector</b> Demonstrate the ability to inspect and test switch circuit controller or point detector. (236.103)	<p>Given a switch location equipped with a switch circuit controller or point detector and an appropriate switch obstruction test gage the employee with demonstrate the ability to:</p> <p><b>WARNING:</b> Tests should not be conducted while rail traffic is approaching or within the section to be tested.</p> <p><b>NOTE:</b> This inspection and test is required every three (3) months.</p>	<p>Determine if five (5) switches equipped with a switch circuit controller connected to the switch point, or with a facing-point lock and circuit controller indicated to the signal system that the switch is open when the switch point is opened one-fourth inch or more on a facing-point switch, or three-eighths inch or more on a trailing point switch and record the results with 100 percent accuracy.</p> <p>Employee must ensure that track or control circuits will be opened or shunted or both and if equipped with facing-point lock with circuit controller, switch cannot be locked.</p> <p>Employee must inspect the physical location to ensure that on each hand-operated switch, switch circuit controllers, facing-point locks, and switch-and-lock movements that all connections are securely fastened in place, and contacts maintained with an opening of not less than one-sixteenth inch when open. Furthermore, the employee must successfully conduct a general inspection to determine the serviceability of cam bearings, shunt wires, wiring, gaskets, etc.</p> <p>This inspection and test applies to all switch circuit controllers and point detectors in all systems as requires by 49 CFR §§236.6, 236.13, 236.51, 236.57, 236.202, 236.203, 236.334 and 236.342.</p> <p>Referenced or associated rules: 49 CFR §§236.6, 236.7, 236.11, 236.13, 236.60, and 236.110.</p>

**Apply 49 CFR Part 236**

<b><u>Performance</u> Tasks</b>	<b><u>Conditions</u> Tools, Equipment, Documents, Practice</b>	<b><u>Standards</u> Time, Completeness, or Accuracy</b>
<b>Task 1-4 Shunt fouling circuit</b> Demonstrate the ability to inspect and test shunt fouling circuit. (236.104)	<p>Given a switch location equipped with a shunt fouling circuit and a tape measure the employee will demonstrate the ability to:</p> <p><b>WARNING:</b> Tests should not be conducted while rail traffic is approaching or within the section to be tested.</p> <p><b>NOTE:</b> This inspection is required every three (3) months.</p> <hr/> <p>Given a switch location equipped with a shunt fouling circuit and a 0.06 ohm track shunt the employee with demonstrate the ability to:</p> <p><b>NOTE:</b> This inspection test is required every three (3) months.</p>	<p>Inspect three (3) Shunt fouling locations to ensure that shunt wires and fouling wires consist of at least two discrete conductors, and each shall be of sufficient conductivity and maintained in such condition that the track relay will be in de-energized position, or device that functions as a track relay will be in its most restrictive state, when the circuit is shunted and record the results with 100 percent accuracy.</p> <p>Inspect the location to ensure that no track circuit dead-sections exist that exceed 35 feet, (where the wheel base of a locomotive operating over the dead section is less than 35 feet the length of the dead section cannot exceed the length of the outer wheelbase of the locomotive).</p> <p>This inspection should determine the condition of insulated rail joints, bond wires and fouling wires are applied in compliance with 49 CFR §§236.51, 236.56, 236.57, and 236.58 at the proper locations, are intact and in good condition.</p> <p>This inspection must be accomplished on at least five (5) switch locations and the results recorded with 100 percent accuracy.</p> <hr/> <p>Test the shunt fouling circuit to ensure that the track relay will be in de-energized position or device that functions as a track relay will be in its most restrictive state, when the circuit is shunted by a 0.06 ohm shunt at no less than five switch locations and record the results with 100 percent accuracy.</p> <p>Referenced or associated rules: 49 CFR §§236.11, 236.55, 236.57, 236.58, 236.59, and 236.110.</p>

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<u>Performance Tasks</u>	<u>Conditions</u> Tools, Equipment, Documents, Practice	<u>Standards</u> Time, Completeness, or Accuracy
<p><b>Task 1-5 Electric lock</b> Demonstrate the ability to inspect and test electric lock mechanism. (236.105)</p>	<p>Given the appropriate relay test device and the appropriate manufacturer's design specification and condemning limits, the employee must be able to demonstrate the ability to:</p> <p><b>WARNING:</b> Tests should not be conducted while rail traffic is approaching or within the section to be tested.</p> <p><b>Note:</b> This test is required every 2 years only for <b>non-force drop type</b> electric switch lock mechanisms.</p>	<p>Test the electromagnetic coils of a five (5) electric switch lock mechanism to ensure that they are operating within the manufacturer's design parameters (if applicable). This test includes pick-up, release, and working values and record the results with 100 percent accuracy. They may be recorded in either voltage or current values.</p> <p><b>Note:</b> This requirement only applies to <b>non-force drop type</b> electric switch lock mechanisms.</p> <p><b>Note:</b> Completion of Task 1-6 as required by 236.106 satisfies the requirements of this task.</p> <p>Referenced or associated rules: 49 CFR §§236.8 and 236.110.</p>

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<u>Performance</u> Tasks	<u>Conditions</u> Tools, Equipment, Documents, Practice	<u>Standards</u> Time, Completeness, or Accuracy
<p><b>Task 1-6 Relay</b> Demonstrate the ability to inspect and test relays. (236.106)</p>	<p>Given the appropriate relay test device and the appropriate manufacturer's design specification and condemning limits, the employee must be able to demonstrate the ability to:</p> <p><b>WARNING:</b> Tests should not be conducted while rail traffic is approaching or within the section to be tested.</p> <p><b>Note:</b> This test is required:</p> <p>Every 4 years for dc relays,</p> <p>Every 2 years for ac relays, and</p> <p>Every year for ac centrifugal relays.</p> <p>Maintaining proficiency at this task may be problematic. Hence, retraining may be required before repeating this task.</p>	<p>Test at least ten (10) dc relays to ensure that they are operating within the manufacturer's design parameters (if applicable).</p> <p>Test at least ten (10) ac vane-type relays to ensure that they are operating within the manufacturer's design parameters (if applicable).</p> <p>Test at least ten (10) ac centrifugal relays to ensure that they are operating within the manufacturer's design parameters (if applicable).</p> <p>This test includes pick-up, release, and working values. They may be recorded in either voltage or current values.</p> <p>If a relay fails to function in accordance with the manufacturer's design parameters, remove the device from service per 236.101.</p> <p>Employee should observe the relay for improperly installed or burnt ribbons and contacts, broken glass, and for moisture or foreign materials inside the relay.</p> <p>The employee must complete this task on at least five (5) relays of each type and record the results with 100-percent accuracy.</p> <p>Referenced or associated rules: 49 CFR §§236.8, 236.101 and 236.110.</p>

Apply 49 CFR Part 236		
<u>Performance Tasks</u>	<u>Conditions</u> Tools, Equipment, Documents, Practice	<u>Standards</u> Time, Completeness, or Accuracy
<p><b>Task 1-7 Ground tests</b> Demonstrate the ability to conduct the ground test to detect circuit ground(s). (236.107)</p>	<p>Given a Volt-Ohm-Milliamp VOM meter, and the applicable circuit plan, the employee must be able to demonstrate the ability to:</p> <p><b>WARNING:</b> A current reading must not be taken when a train is approaching or passing the location.</p> <p><b>WARNING:</b> A VOM meter or other test equipment must not be left unattended when connected to the energy bus and ground.</p> <p><b>WARNING:</b> Tests should not be conducted while rail traffic is approaching or within the section to be tested.</p>	<p>Determine which circuits affect the proper function of the signal system.</p> <p>Detect any circuit ground or combination of grounds that permit a current flow of 75 percent or more of the release value of any relay or electromagnet device in the circuit.</p> <p>Troubleshoot, locate, and eliminate the ground or grounds.</p> <p>Alternatively, if the ground(s) cannot be eliminated or reduced to less than 75 percent of the release value of any relay or electromagnet device in the circuit, take appropriate action(s) to warn highway traffic and railroad employees.</p> <p>This test is to be made at each energy bus that feeds signal system components and circuits. The test shall be made by measuring the voltage potential between each energy bus and ground. If a voltage potential is detected between an energy bus and ground, a current reading will be taken to determine compliance with 49 CFR §236.2.</p> <p>This task must be complete at least five (5) times and record the results with 100 percent accuracy.</p> <p>Referenced or associated rules: 49 CFR §§236.2, 236.8, and 236.110.</p>

Apply 49 CFR Part 236		
<u>Performance</u> Tasks	<u>Conditions</u> Tools, Equipment, Documents, Practice	<u>Standards</u> Time, Completeness, or Accuracy
<p><b>Task 1-8 insulation resistance tests, wires in trunking and cable</b></p> <p>Demonstrate the ability to conduct test to determine Insulation resistance of wires in trunking and cables. (236.108)</p>	<p>Given a megohmmeter (Megger) or other high voltage resistance checking device the employee must be able to demonstrate the ability to:</p> <p><b>WARNING:</b> Tests should not be conducted while rail traffic is approaching or within the section to be tested.</p> <p><b>NOTE:</b> Test must be made when wires, cable, and insulation are dry.</p> <p><b>NOTE:</b> Track wires, line wires, and case wiring are excluded from the requirements of this test.</p> <p><b>NOTE:</b> This test is required every ten years. Maintaining proficiency at this task may be problematic. Hence, retraining may be required before repeating this task.</p>	<p>Determine if wires, cables, and insulation are dry.</p> <p>Determine the insulation resistance value of at least ten (10) conductors, between each other and between each conductor and ground.</p> <p>Take action to repair or replace any wire or cable whose resistance between any wires or between any wires and ground is less than 500,000 ohms.</p> <p>Immediately remove from service any wire or cable with an insulation resistance between wires or between any wire and ground is less than 200,000 ohms.</p> <p>If the trunking or cable fails to function as required above, make the necessary repair, or replacement, or take action as required by §236.108.</p> <p>This task must be successfully completed on at least one trunking or one multi-conductor cable and the results properly recorded with 100 percent accuracy.</p> <p>Referenced or associated rules: 49 CFR §235.110.</p>

Apply 49 CFR Part 236		
<u>Performance</u> Tasks	<u>Conditions</u> Tools, Equipment, Documents, Practice	<u>Standards</u> Time, Completeness, or Accuracy
<p><b>Task 1-9 Time releases, timing relays and timing devices</b> Demonstrate the ability to test time release, timing relays and timing devices. (236.109)</p>	<p>Given a watch or other accurate timing device and the location circuit plans the employee must be able to demonstrate the ability to:</p> <p>This standard must be successfully completed on at least three time release, timing relays and timing devices for each type of application that requires a time delay. If three time release, timing relays and timing devices are not available the task must be completed three times on the same time release, timing relays and timing devices on three different inspections.</p> <p><b>WARNING:</b> Tests should not be conducted while rail traffic is approaching or within the section to be tested.</p> <p><b>NOTE:</b> This rule requires that the predetermined time interval that the device must operate be indicated on the circuit plan or marked on the device.</p>	<p>Determine that timing relays and timing devices are maintained such that the timed interval are not less than 90 percent of the value as indicated on the circuit plans.</p> <p>If the timing relay or timing device fails to function as intended, make the necessary adjustment, repair, or replacement, or take action other actions to ensure the safety of motorists and pedestrians.</p> <p>This test is required to determine the length of time that a time release, timing relay, or timing device will run before the circuit locking is released.</p> <p>The test shall be conducted by starting the time release, timing relay, or timing device and measuring the length of time from when the device started operating until the circuit locking is released.</p> <p>Release time must not be less than 90 percent of the value indicated on the circuit plans or on the device.</p> <p>The test must be completed and the results properly recorded for five (5) timing devices with 100 percent accuracy.</p> <p>Referenced or associated rules: 49 CFR §§236.8, and 236.110.</p>

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<b><u>Performance</u> Tasks</b>	<b><u>Conditions</u> Tools, Equipment, Documents, Practice</b>	<b><u>Standards</u> Time, Completeness, or Accuracy</b>
<b>Task 2-1 Mechanical locking</b> Demonstrate the ability to test mechanical locking. (236.376)	<p>Given a mechanical interlocking, the corresponding Dog Sheet and track and location plan the employee must be able to demonstrate the ability to:</p> <p><b>WARNING:</b> Tests should not be conducted while rail traffic is approaching or within the section to be tested.</p> <p><b>NOTE:</b> This test is required every two years. Maintaining proficiency at this task may be problematic. Hence, retraining may be required before repeating this task.</p>	<p>Ensure that once a route is established through the interlocking plant that no switches in the route can be moved and that no opposing or conflicting signals can display a signal indication more favorable than "Stop". This task needs to be completed with 100 percent accuracy for at least three separate routes.</p> <p>Referenced or associated rules: 49 CFR §§ 236.110, 236.304, 236.208, 236.326, 236.335, 236.336, 236.337, 236.338, 236.339, 236.340, and 236.341.</p>

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<u>Performance Tasks</u>	<u>Conditions</u> Tools, Equipment, Documents, Practice	<u>Standards</u> Time, Completeness, or Accuracy
<p><b>Task 2-2 Approach locking</b> Demonstrate the ability to test approach locking at a manual interlocking, traffic control point, automatic interlocking, and/or hand operated electrically locked switch. (236.377)</p>	<p>Given a manual or automatic interlocking plant, traffic control point, and/or hand operated electrically locked switch, the corresponding circuit plans and track and location plans the employee must be able to demonstrate the ability to:</p> <p><b>WARNING:</b> Tests should not be conducted while rail traffic is approaching or within the section to be tested.</p> <p><b>NOTE:</b> This test is required every two years. Maintaining proficiency at this task may be problematic. Hence, retraining may be required before repeating this task.</p>	<p>Ensure that once a route has been established through the interlocking plant, traffic control point, or hand operated hand operated electrically locked switch with the signal governing movement over that route displaying a proceed aspect that if the signal is set to "Stop" the route will remain locked if a train is on the approach to that route. This task needs to be completed and the results properly recorded with 100 percent accuracy for at least five (5) separate routes for each applicable signal arrangement. (i.e., manual interlocking, traffic control point, automatic interlocking, and/or hand operated electrically locked switch).</p> <p>This test applies to both interlocking and traffic control systems. Applies to approach locking of both power operated devices and electrically locked hand-operated switches in both interlockings and traffic control systems.</p> <p>Referenced or associated rules: 49 CFR §§236.110, 236.305 236.308 and 236.760.</p>

**Apply 49 CFR Part 236**

<b><u>Performance</u> Tasks</b>	<b><u>Conditions</u> Tools, Equipment, Documents, Practice</b>	<b><u>Standards</u> Time, Completeness, or Accuracy</b>
<b>Task 2-3 Time locking</b> Demonstrate the ability to test time locking. (236.378)	<p>Given an interlocking plant, the corresponding circuit plans and track and location plans the employee must be able to demonstrate the ability to:</p> <p><b>WARNING:</b> Tests should not be conducted while rail traffic is approaching or within the section to be tested.</p> <p><b>NOTE:</b> This test is required every two years. Maintaining proficiency at this task may be problematic. Hence, retraining may be required before repeating this task.</p>	<p>Ensure that once a route has been established through the interlocking plant with the signal governing movement over that route displaying a proceed aspect that if the signal is set to “Stop” the route will remain locked for a predetermined amount of time as indicated on the circuit plans. This task needs to be completed with 100 percent accuracy and the results properly recorded for at least five (5) separate routes.</p> <p>Referenced or associated rules: 49 CFR §§236.109, 236.110, 236.305, 236.308 and 236.768.</p>

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<u>Performance</u> Tasks	<u>Conditions</u> Tools, Equipment, Documents, Practice	<u>Standards</u> Time, Completeness, or Accuracy
<p><b>Task 2-4 Route locking</b> Demonstrate the ability to test route locking. (236.379)</p>	<p>Given an interlocking plant, the corresponding circuit plans and track and location plans the employee must be able to demonstrate the ability to:</p> <p><b>WARNING:</b> Tests should not be conducted while rail traffic is approaching or within the section to be tested.</p> <p><b>NOTE:</b> This test is required every two years. Maintaining proficiency at this task may be problematic. Hence, retraining may be required before repeating this task.</p>	<p>Ensure that once a route has been established through the interlocking plant with the signal governing movement over that route displaying a proceed aspect that once a train enters that route the route will remain locked until the train has traversed the route. This task needs to be completed and the results properly recorded with 100 percent accuracy for at least five (5) separate routes.</p> <p>Referenced or associated rules: 49 CFR §§236.110, 236.302, 236.308, 236.309 and 236.767.</p>

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<u>Performance</u> Tasks	<u>Conditions</u> Tools, Equipment, Documents, Practice	<u>Standards</u> Time, Completeness, or Accuracy
<p><b>Task 2-5 Indication locking</b> Demonstrate the ability to test indication locking, (236.380)</p>	<p>Given an interlocking plant, the corresponding circuit plans and track and location plans the employee must be able to demonstrate the ability to:</p> <p><b>WARNING:</b> Tests should not be conducted while rail traffic is approaching or within the section to be tested.</p> <p><b>NOTE:</b> This test is required every two years. Maintaining proficiency at this task may be problematic. Hence, retraining may be required before repeating this task.</p>	<p>Ensure that if any signal, switch, or other operative device fails to make a movement corresponding to the units controlling lever that any manipulation of levers that would result in an unsafe condition for train movements is prevented.</p> <p>Ensure that the operation of any signal, switch, or other operative device will not operate in case another unit which should operate first fails to make the required movement.</p> <p>This task needs to be completed and the results properly recorded with 100 percent accuracy for at least five (5) separate routes.</p> <p>Referenced or associated rules: 49 CFR §§236.110, 236.307, 236.308 and 236.762.</p>

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<u>Performance</u> Tasks	<u>Conditions</u> Tools, Equipment, Documents, Practice	<u>Standards</u> Time, Completeness, or Accuracy
<p><b>Task 2-6 Traffic locking</b> Demonstrate the ability to test traffic locking. (236.281)</p>	<p>Given an interlocking plant, the corresponding circuit plans and track and location plans the employee must be able to demonstrate the ability to:</p> <p><b>WARNING:</b> Tests should not be conducted while rail traffic is approaching or within the section to be tested.</p> <p><b>NOTE:</b> This test is required every two years. Maintaining proficiency at this task may be problematic. Hence, retraining may be required before repeating this task.</p>	<p>Ensure that the direction of traffic on a section of track cannot be changed while that section is occupied or while a signal displays an aspect for a movement to proceed into that section. This task needs to be completed and the results properly recorded with 100 percent accuracy for at least five (5) separate routes.</p> <p>Referenced or associated rules: 49 CFR §§236.110, 236.308 and 236.769</p>

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<u>Performance</u> Tasks	<u>Conditions</u> Tools, Equipment, Documents, Practice	<u>Standards</u> Time, Completeness, or Accuracy
<p><b>Task 2-7 Switch obstruction test</b> Demonstrate the ability to conduct a switch obstruction test. (236.382)</p>	<p>Given a power operated switch machine location, a hand crank, and a switch obstruction gauge the employee must be able to demonstrate the ability to:</p> <p><b>WARNING:</b> Tests should not be conducted while rail traffic is approaching or within the section to be tested.</p> <p><b>NOTE:</b> This rule applies to pipe-connected, mechanically operated switches; electric switches; electro-hydraulic switches; electro-pneumatic switches; and hand-operated switch machines with lock rods, where such hand-operated switch machines are located within interlockings or traffic control systems.</p> <p><b>NOTE:</b> This test is required every month.</p>	<p>Ensure that the of lock rod of each power operated switch machine and the lock rod of each hand-operated switch equipped with switch-and-lock-movement is maintained so that it cannot be locked when the point is open three-eighths inch or more.</p> <p>This task must be successfully completed on at least ten separate switches and the results properly recorded with 100 percent accuracy. If ten power operated switch machines are not available the standard can be modified to allow ten repetitions on those machines that are available on at least three consecutive days.</p> <p>Referenced or associated rules: 49 CFR §§236.7, 236.107, 236.110 and 236.327.</p>

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<u>Performance Tasks</u>	<u>Conditions</u> Tools, Equipment, Documents, Practice	<u>Standards</u> Time, Completeness, or Accuracy
<p><b>Task 2-8 Valve locks and valve magnets</b> Demonstrate the ability to test valve locks, valves, and valve magnets. (236.383)</p>	<p>Given an interlocking plant equipped with a electro-pneumatic switch machine within an interlocking and the appropriate hand tools the employee must demonstrate the ability to test the “CP” and/or “D” values (or other pneumatic devices) for proper operation.</p> <p><b>WARNING:</b> Tests should not be conducted while rail traffic is approaching or within the section to be tested.</p> <p><b>NOTE:</b> This test is required every year. Maintaining proficiency at this task may be problematic. Hence, retraining may be required before repeating this task.</p>	<p>The purpose of the test is to ensure the proper functioning of critical pneumatic devices in an electro-pneumatic interlocking plant or traffic control point. This test must be completed with 100 percent accuracy and the results properly recorded no less than 10 times.</p> <p>Referenced or associated rules: 49 CFR §§236.11, 236.110 and 236.837.</p>

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<u>Performance Tasks</u>	<u>Conditions</u> Tools, Equipment, Documents, Practice	<u>Standards</u> Time, Completeness, or Accuracy
<b>Task 2-9 Cross protection</b> Demonstrate the ability to conduct a cross protection test. (236.384)	<p>Given an interlocking plant equipped with cross protection, a variable resistor, a VOM, or other electronic test device, and appropriate hand tools the employee must be able to demonstrate the ability to:</p> <p><b>WARNING:</b> Tests should not be conducted while rail traffic is approaching or within the section to be tested.</p> <p><b>NOTE:</b> This rule applies only to those interlockings provided with cross protection devices. This test insures that switches, signals, etc., do not respond when current is improperly applied to circuits.</p> <p><b>NOTE:</b> This test is required every six months. Maintaining proficiency at this task may be problematic. Hence, retraining may be required before repeating this task.</p>	<p>Conduct the necessary test to ensure that the cross protection at an interlocking is functioning properly to prevent the improper operation of a signal, switch, movable-point frog, or derail as the result of a cross in electrical circuits. This test must be accomplished and the results properly recorded with 100 percent accuracy on at least five (5) separate circuits provided with cross protection.</p> <p>Referenced or associated rules: §§49 CFR §§ 236.110 and 236.787.</p>

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<u>Performance Tasks</u>	<u>Conditions</u> Tools, Equipment, Documents, Practice	<u>Standards</u> Time, Completeness, or Accuracy
<p><b>Task 2-10 Restoring feature on power switches</b> Demonstrate the ability to test the restoring feature on power switches. (236.386)</p>	<p>Given a power operated switch machine location and a hand crank employee must be able to demonstrate the ability to:</p> <p><b>WARNING:</b> Tests should not be conducted while rail traffic is approaching or within the section to be tested.</p> <p><b>NOTE:</b> This test is required every three months.</p>	<p>Ensure that before the driving bar creeps sufficiently to unlock the switch the power is applied to restore the switch movement to full normal or to full reverse position in correspondence with the control lever. This test must be accomplished at least five (5) times and the results properly recorded with 100 percent accuracy.</p> <p>Referenced or associated rules: 49 CFR §§ 236.110 and 236.746.</p>

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<u>Performance Tasks</u>	<u>Conditions</u> Tools, Equipment, Documents, Practice	<u>Standards</u> Time, Completeness, or Accuracy
<b>Task 2-11 Moveable bridge locking</b> Demonstrate the ability to test movable bridge locking. (236.387)	<p>Given a moveable bridge that is interlocked with the signal system, applicable gauges, circuit plans, and a power operated switch machine location and a hand crank employee must be able to demonstrate the ability to:</p> <p><b>WARNING:</b> Tests should not be conducted while rail traffic is approaching or within the section to be tested.</p> <p><b>NOTE:</b> This test is required every year. Maintaining proficiency at this task may be problematic. Hence, retraining may be required before repeating this task.</p>	<p>Determine that a movable bridge is in the proper position and alignment and that all associated rail locks, bridge locks, bolt locks, circuit controllers, and electric locks used in providing interlocking protection at a movable bridge are functioning as intended. This task must be completed and the results properly recorded no less than five (5) time with 100 percent accuracy.</p> <p>Referenced or associated rules: §49 CFR §§ 236.110, 236.312 and 236.766.</p>

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<u>Performance</u> Tasks	<u>Conditions</u> Tools, Equipment, Documents, Practice	<u>Standards</u> Time, Completeness, or Accuracy
<p><b>Task 3-1</b> Demonstrate the ability to check for positioning and alinement of roadway element. (236.576)</p>	<p>Given an automatic train stop, train control, or cab signal system equipped with roadway elements, such as electrical circuits, indicators, or trip arms the employee must be able to demonstrate the ability to:</p> <p><b>WARNING:</b> Tests should not be conducted while rail traffic is approaching or within the section to be tested.</p> <p><b>NOTE:</b> Applies to automatic train stop only.</p> <p><b>NOTE:</b> Alinement is checked every month.</p> <p><b>NOTE:</b> Testing is required every six months.</p>	<p>Gauge the height and alinement of the roadway elements, test the device for functionality within this part and the manufacturer's or railroad's specification and properly record the results at least five (5) times with 100 percent accuracy.</p> <p>Referenced or associated rules: 49 CFR §§236.110, 236.505, 236.526, 236.527, 236,529, 236,531, 236.532, 236.560 and 236.744.</p>

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<b><u>Performance</u> Tasks</b>	<b><u>Conditions</u> Tools, Equipment, Documents, Practice</b>	<b><u>Standards</u> Time, Completeness, or Accuracy</b>
<b>Task 3-2</b> Demonstrate the ability to test the function of test equipment, acknowledgement, and cut-in circuits. (236.577)	<p>Given an automatic cab signals, automatic train stop, or automatic train control system with test acknowledgement circuits, and/or cut-in circuits and the appropriate test equipment or a locomotive equipped with on-board test equipment, the employee will demonstrate the ability to:</p> <p><b>WARNING:</b> Tests should not be conducted while rail traffic is approaching or within the section to be tested.</p> <p><b>NOTE:</b> The requirements of this subpart are different for different systems. The FRA Signal and Train Control Compliance Manual should be consulted for specific requirements.</p> <p><b>NOTE:</b> This subpart requires that cut-in circuits, portable testers, and on-board test equipment be tested every year.</p> <p><b>NOTE:</b> This test is required every year. Maintaining proficiency at this task may be problematic. Hence, retraining may be required before repeating this task.</p>	<p>Test the function of test equipment, acknowledgement circuits and cut-in circuits to ensure proper operation of the automatic cab signals, automatic train stop, or automatic train control system. This test must be accomplished ten times on each type of unit and the results properly recorded with 100 percent accuracy for each type of system.</p> <p>Referenced or associated rules: 49 CFR §§236.110, 236.505, 236.526, 236.527, and 236.744.</p>

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<b><u>Performance</u> Tasks</b>	<b><u>Conditions</u> Tools, Equipment, Documents, Practice</b>	<b><u>Standards</u> Time, Completeness, or Accuracy</b>
<b>Task 3-3</b> Demonstrate the ability to conduct daily or after trip tests. (236.586)	<p>Given a locomotive equipped with automatic train stop, automatic cab signals, or automatic train control the employee will demonstrate the ability to:</p> <p><b>NOTE:</b> The requirements of this subpart are different for different systems. The FRA Signal and Train Control Compliance Manual and the manufacture's specifications should be consulted for specific requirements.</p> <p><b>NOTE:</b> this test is required each calendar day that the locomotive is used in automatic train stop, automatic cab signals, or automatic train control territory.</p>	<p>Conduct and properly record the daily or after trip test with 100 percent accuracy on at least five (5) locomotives. The purpose is to ensure that each locomotive's on-board equipment is functioning properly prior to being dispatched into automatic train stop, automatic cab signal, or automatic train control territory.</p> <p>Referenced or associated rules: 49 CFR §§236.110, 236.505, 236.514, 236.564.</p>

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<b><u>Performance</u> Tasks</b>	<b><u>Conditions</u> Tools, Equipment, Documents, Practice</b>	<b><u>Standards</u> Time, Completeness, or Accuracy</b>
<b>Task 3-4</b> Demonstrate the ability to conduct a departure test. (236.587)	<p>Given a locomotive equipped with automatic train stop, automatic cab signals, or automatic train control and either an over track element, in track test circuit, portable test unit, or on-board test device the employee will demonstrate the ability to:</p> <p><b>NOTE:</b> The requirements of this subpart are different for different systems. The FRA Signal and Train Control Compliance Manual and the manufacture's specifications should be consulted for specific requirements.</p> <p><b>NOTE:</b> This test is required prior to a locomotive entering automatic train stop, automatic cab signals, or automatic train control territory.</p>	<p>Conduct a departure test and record the results with 100 percent accuracy on at least five (5) locomotives. The purpose is to ensure that each locomotive's on-board equipment is functioning properly prior to being dispatched into automatic train stop, automatic cab signal, or automatic train control territory.</p> <p>Referenced or associated rules: 49 CFR §236.110,</p>

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<b><u>Performance</u> Tasks</b>	<b><u>Conditions</u> Tools, Equipment, Documents, Practice</b>	<b><u>Standards</u> Time, Completeness, or Accuracy</b>
<b>Task 3-5</b> Demonstrate the ability to conduct a periodic test. (236.588)	<p>Given a locomotive equipped with automatic train stop, automatic cab signals, or automatic train control on a mechanical shop equipped to conduct such tests the employee will demonstrate the ability to:</p> <p><b>NOTE:</b> The requirements of this subpart are different for different systems. The FRA Signal and Train Control Compliance Manual and the manufacturer's specifications should be consulted for specific requirements.</p> <p><b>NOTE:</b> This test is required on locomotives equipped with automatic train stop, automatic cab signals, or automatic train control at least once every 92 days.</p>	<p>Conduct a periodic test and record the results with 100 percent accuracy on at least ten (10) locomotives.</p> <p>Referenced or associated rules: 49 CFR §§236.110, 236.513, 236.515, 236.516, 236.551, 236.552, 236.554, 236.555, 236.556, 236.557, 236.563, and 236.564.</p>

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<u>Performance</u> Tasks	<u>Conditions</u> Tools, Equipment, Documents, Practice	<u>Standards</u> Time, Completeness, or Accuracy
<p><b>Task 3-6</b> Demonstrate the ability to test a relay and determine its serviceability and disposition. (236.589)</p>	<p>Given a mechanical electrical, or signal shop equipped to inspect, clean, and test relays and the manufacturer's specifications the employee will demonstrate the ability to:</p> <p><b>NOTE:</b> This test is required every six years for on-board relays and every two years for master or primary relays of the torque type. Maintaining proficiency at this task may be problematic. Hence, retraining may be required before repeating this task.</p>	<p>Determine the serviceability of at least ten (10) relays and properly record the results of each type that are part of an automatic train stop, automatic cab signal, or automatic train control system.</p> <p>Referenced or associated rules: 49 CFR §§236.8, 236.11, and 236.110.</p>

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<b><u>Performance</u> Tasks</b>	<b><u>Conditions</u> Tools, Equipment, Documents, Practice</b>	<b><u>Standards</u> Time, Completeness, or Accuracy</b>
<b>Task 3-7</b> Demonstrate the ability to test and determine the serviceability of pneumatic apparatus. (236.590)	<p>Given a mechanical shop equipped to inspect, clean, and test pneumatic devices as per 49 CFR 229.29 and the manufacturer's specifications the employee will demonstrate the ability to:</p> <p><b>NOTE:</b> This test is required at various intervals as per 49 CFR 229.29. Maintaining proficiency at this task may be problematic. Hence, retraining may be required before repeating this task.</p>	<p>Inspect, clean, and test and record the results on at least ten (10) pneumatic devices of each type that are components of an automatic train stop, automatic cab signal, or automatic train control system with 100 percent accuracy.</p> <p>Referenced or associated rules: 49 CFR §§229.29(a), 229.33 and 236.110.</p>

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